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09/921,278	08/02/2001	Stefan Klemens Muller	5150-47700	5339

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EXAMINER

PATEL, NIMESH G

ART UNIT	PAPER NUMBER
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2112

DATE MAILED: 03/26/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,278

Applicant(s)

MULLER ET AL.

Examiner

Nimesh G Patel

Art Unit

2112

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation "the scheduled execution," "the processor," "this value," and "the predetermined time" in lines 1, 3-4, and 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 2 recites the limitations "the interrupt signal," "the predetermined time," "the expected maximum delay," and "the interrupt input" in lines 1-3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 4 recites the limitation "the time stamp counter" and "the central processing unit" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

6. Claim 5 recites the limitation "the interrupt signal" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 7 recites the limitation "the count register" and "corresponding interrupt signal" in lines 2 and 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8. Regarding claim 8, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

9. Claim 11 recites the limitation "the operating system" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

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10. Claim 12 recites the limitation "the address," "the interrupt table," "the addresses," "the service routines," and "the various interrupt inputs" in lines 1-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 14 recites the limitation "the operating system" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 16 recites the limitations "the interrupt signal" and "the next interrupt signal" in lines 2 and 4-5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 17 recites the limitation "the processor registers" and "the stack" in lines 2-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

14. Claim 18 recites the limitation "the currently executed interrupt" and "the interrupt controller" in lines 2-3 of the claim. There is insufficient antecedent basis for this limitation in the claim. Also, the claim seems unclear as to when the end-of-interrupt command is executed. Is the beginning, during, or the end of the processing of the interrupt being acknowledged by the end-of-interrupt command.

15. Claim 19 recites the limitation "the original function" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 20 recites the limitation "the interrupt input" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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18. Claims 1, 3-5, 11-13, 16-17, and 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Mulholland et al.('905), hereinafter referred to as Mulholland.

19. Regarding claim 1, Mulholland discloses a method for the scheduled execution of program steps (target function)(Column 6, Liners 27-28, DosTimer Function) by the processor of a computer at predetermined times, in which a register(Column 6, Line 52, TicksLeft) of the computer is repeatedly read and this value is compared with a reference value(Column 5, Line 24, IntervalTicks) representing the predetermined time, wherein when the read value corresponds to the reference value, the target function is executed in the processor(Column 6, Lines 58-61), characterized in that the reading of the register is performed within a start function which is executed by the processor as an interrupt service routine(Column 6, Lines 25-26, Timer interrupt service routine).

20. Regarding claim 3, Mulholland discloses a count register(TicksLeft) that is used as a register.

21. Regarding claim 4, Mulholland discloses a method, characterized in that the time stamp counter (TSC) of the central processing unit (CPU) of the computer is used as a count register(Time stamp counter is part of modern Pentium CPUs and is used as a count register).

22. Regarding claim 5, Mulholland discloses a method, characterized in that the interrupt signal is triggered by a timer of the computer as a timer interrupt(Column 1, Line 34).

23. Regarding claim 11, Mulholland discloses a method, characterized in that a timer interrupt is used that other programs running simultaneously on the computer, in particular, the operating system, use to call an original function(It is inherent that the timer interrupt is used by the operating system to call the original function).

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24. Regarding claim 12, Mulholland discloses a method, characterized in that the address of the original function is read from the interrupt table which contains the addresses of the service routines associated with the various interrupt inputs and the address of the original function is replaced by the address of the start function(Column 5, Lines 43-47).

25. Regarding claim 13, Mulholland discloses a method, characterized in that both the scheduled target function to be executed and also the original function are executed by an interrupt request by means of the start function(Column 5, Lines 43-47).

26. Regarding claim 16, Mulholland discloses a method, characterized in that a list with the predetermined times for the execution of the target function(Column 3, Line 60; IntervalMinutes indicates the predetermined times) and a list with the times when the interrupt signal will be triggered are created(Column 5, Lines 25-29; Timer interrupt is triggered 1090.9 times per minute), in that the start function compares the next time of the execution of the target function with the time of the next interrupt signal and causes the execution of the original function if the next interrupt signal appears at least the maximum delay before the next time of execution of the target function(Column 6, Lines 56-61; If the predetermined time has not been reached, the original function is executed. The next signal interrupt signal will appear at least the maximum delay before the next appearance of the interrupt signal since the timer interrupt is triggered at a much greater rate than the Target function(1090.9 times per minute compared to once every 30 minutes(default interval))).

27. Regarding claim 17, Mulholland discloses a method, characterized in that at the beginning of the start function, the register contents of the processor registers that are changed by the start function are pushed onto the stack of the computer and at the end of the start function, these contents are written back into the registers(It is inherent to handle ISRs using PUSH and POP commands to save and restore the state of the system).

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28. Regarding claim 19, Mulholland discloses a method, characterized in that the original function is activated by a jump command by means of the start function(Figure 4, 302; Once the start function is finished, the function returns(jumps) to the original function).

29. Regarding claim 20, Mulholland discloses a method, characterized in that during its runtime, the start function determines whether there is an additional interrupt signal at the interrupt input and if so, sends an error report to the target function(Column 6, Lines 40-50).

30. Regarding claim 21, Mulholland discloses a software program product to be loaded into working memory of a computer operated by an operating system with a processor and a count register, characterized in that it includes a program step sequence for executing a method(Column 2, Lines 49-53).

31. Regarding claim 22, Mulholland discloses a machine-readable data carrier with a software program stored on the data carrier(Column 2, Lines 49-53), wherein the software program implements a method for the scheduled execution of program steps (target function)(Column 6, Lines 27-28, DosTimer Function) at predetermined times, in which a register(Column 6, Line 52, TicksLeft) of the computer is repeatedly read and this value is compared with a reference value(Column 5, Line 24, IntervalTicks) representing the predetermined time, wherein when the read value corresponds to the reference value, the target function is executed(Column 6, Lines 58-61), characterized in that the reading of the register is performed within a start function which is executed by the processor as an interrupt service routine(Column 6, Lines 25-26, Timer interrupt service routine).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

33. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

34. Claims 2, 6-7, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulholland, in view of Lever('840).

35. Regarding claim 2, Mulholland discloses a method, characterized in that the interrupt signal is triggered with a lead time before the predetermined time(Column 5, Lines 27-29; Timer interrupt is executed 1090.9 times per minute, which means the interrupt signal is triggered before the predetermined time of 30 minutes)

Mulholland does not specifically disclose the lead time defined so that it is greater than the expected maximum delay between the appearance of the interrupt signal at the interrupt input of the processor and the execution of the start function. However, Lever discloses calculating maximum delay(Column 2, Line 60-Column 3 Line 10) between the appearance of the interrupt signal and the execution of the start function. It would have been obvious to calculate the maximum delay, as disclosed by Lever, in Mulholland's system to have the lead time greater than the maximum delay, since this would guarantee the execution of the target function at the predetermined time.

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36. Regarding claim 6, Lever discloses a method, characterized in that the expected maximum delay is determined continuously during the runtime of the computer(Column 3, Lines 30-31).

37. Regarding claim 7, Lever discloses a method, characterized in that the value for the maximum delay is determined on the basis of the actual delay which is acquired by reading the count register at the beginning of the start function and by subtracting the value representing the time of appearance of the corresponding interrupt signal(Column 2, Line 60-Column 3 Line 10).

38. Regarding claim 9, Lever discloses a method, characterized in that when the determined maximum delay exceeds an upper limit, an error report is generated(Column 3, Lines 40-42).

39. Regarding claim 10, Lever discloses a method, characterized in that when the determined maximum delay exceeds the upper limit, the value for the lead time is set equal to this limit(Column 7, Lines 60-64; Appropriate action would be to increase the lead time to the maximum delay, so that the target function is executed at the predetermined time).

40. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulholland, in view of Chih-Hao Tsai(PCTimer: Millisecond Resolution Timing with DJGPP V2 and DPMI), hereinafter referred to as Tsai.

41. Regarding claim 14, Mulholland does not specifically disclose a method, characterized in that the timer is adjustable to various clock rates by the operating system and in that before the beginning of the method it is set to the maximum clock rate. However, Tsai discloses the operating system having the ability to adjust the timer to various clock rates(Pages 2-3). It would have been obvious to adjust the timer clock rate, as disclosed by Tsai, to the maximum clock rate in Lever's system, since this would allow the timer interrupt to be triggered more often, ensuring the target function gets executed at the predetermined time.

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42. Regarding claim 15, Tsai discloses a method, characterized in that the clock rate of the timer is changed by the method and reset to the maximum clock rate before the end of the method(Page 3).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nimesh G Patel whose telephone number is 703-305-7583. The examiner can normally be reached on M-F, 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H Rinehart can be reached on 703-305-4815. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nimesh G Patel
Examiner
Art Unit 2112

NP NP
March 9, 2004


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